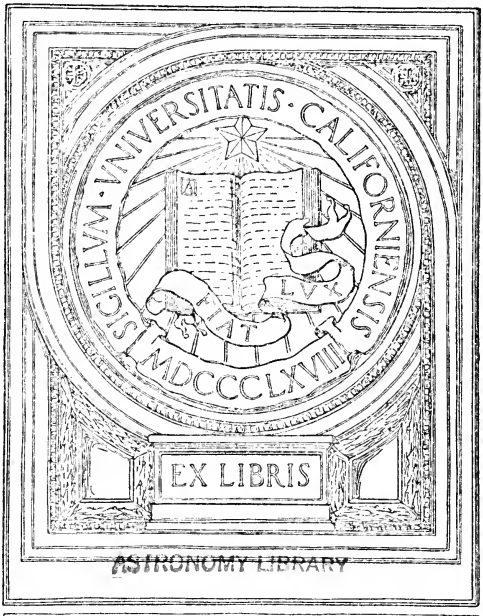

FOUR-PLACE LOGARITHMS

BY

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I. Four-place Logarithms of Three-figure Numbers.

II. The Natural Sines, Cosines, Tangents, and Cotangents of Angles differing by Ten Minutes, and their Four-place Logarithms.

A good collection of Mathematical Tables is like a Dictionary: it may lie on the shelf for months, but when it is wanted it is wanted, and its use for a single hour may be worth the price of the book.

JONES' FIVE-PLACE LOGARITHMS.

JONES' LOGARITHMIC TABLES.

FOUR-PLACE, SIX-PLACE, AND TEN-PLACE.

(SEE THE THIRD COVER PAGE.)

FOUR-PLACE LOGARITHMS.

FORM OF A LOGARITHM.

THE LOGARITHM of a number is the exponent of that power to which another number, the *base*, must be raised to give the number first named. The base commonly used is 10; and as most numbers are incommensurable powers of 10, a common logarithm, in general, consists of an integer, the *characteristic*, and an endless decimal, the *mantissa*.

If a number be resolved into two factors, of which one is an integer power of 10 and the other lies between 1 and 10, then the exponent of 10 is the characteristic, and the logarithm of the other factor is the mantissa. The characteristic is positive if the number be larger than 1, and negative if it be smaller; the mantissa is always positive. A negative characteristic is indicated by the sign − above it. The logarithms of numbers that differ only by the position of the decimal point have different characteristics but the same mantissa.

E.g. $7770 = 10^3 \times 7.77$ and $\log 7770 = 3.8904$; $.0777 = 10^{-2} \times 7.77$, and $\log .0777 = \bar{2}.8904$.

TABLES OF LOGARITHMS.

The logarithms of any set of consecutive numbers, arranged in a form convenient for use, constitute a *table of logarithms*. Such a table to the base 10 need give only the mantissas; the characteristics are manifest. This table is arranged upon the common double-entry plan *i.e.* the mantissa of the logarithm of a three-figure number stands opposite the first two figures and under the third figure. The logarithms are given correct to four places.

TO TAKE OUT THE LOGARITHM OF A NUMBER.

A three-figure number: Take out the tabular mantissa that lies in line with the first two figures of the number and under the third figure; the characteristic is the exponent of that integer power of 10 which lies next below the number.

E.g. $\log 677 = 2.8306$, $\log 6.78 = 0.8312$, $\log .0679 = \bar{2}.8319$, $\log 676\,000 = 5.8299$.

A number of less than three figures: Make the number a three-figure number by annexing zeros, and follow the rule given above.

E.g. $\log 700 = 2.8451$, $\log 7 = 0.8451$, $\log .0071 = \bar{3}.8513$, $\log 71\,000 = 4.8513$.

A four-figure number: Take out the tabular mantissa of the first three figures, and add such part of the difference between this mantissa and the next greater tabular mantissa (the *tabular difference*), as the fourth figure is a part of 10; and so for a five-figure number.

E.g. $\because \log 678 = 2.8312$ and $\log 679 = 2.8319$,

$\therefore \log 678.6 = 2.8312 + .0007 \times 6/10 = 2.8316$, $\log 6.7875 = 0.8312 + .0007 \times 75/100 = 0.8317$.

TO TAKE OUT A NUMBER FROM ITS LOGARITHM.

The mantissa found in the table: Join the figure at the top that lies above the given mantissa to the two figures upon the same line at the extreme left; in this three-figure number so place the decimal point that the number shall be next above that power of 10 whose exponent is the characteristic of the logarithm.

E.g. $\log^{-1} 2.8312 = 678$, $\log^{-1} 0.8451 = 7$, $\log^{-1} \bar{3}.8513 = .0071$, $\log^{-1} 5.8513 = 710\,000$.

The mantissa not found in the table: Take out the three-figure number of the tabular mantissa next less than the given mantissa, and to these three figures join the quotient of the difference of these two mantissas by the tabular difference.

E.g. $\because \log 678 = 2.8312$ and $\log 679 = 2.8319$,

$\therefore \log^{-1} 2.8316 = 678\frac{4}{7} = 678.6$, $\log^{-1} \bar{2}.8317 = .0678\frac{5}{7} = .06787$.

The use of trigonometric ratios and their logarithms is explained in works on trigonometry.

1	0	1	2	3	4	5	6	7	8	9
0	0000	0000	3010	4771	6021	6990	7782	8451	9031	9542
1	0000	0414	0792	1139	1461	1761	2041	2304	2553	2788
2	3010	3222	3424	3617	3802	3979	4150	4314	4472	4624
3	4771	4914	5051	5185	5315	5441	5563	5682	5798	5911
4	6021	6128	6232	6335	6435	6532	6628	6721	6812	6902
5	6990	7076	7160	7243	7324	7404	7482	7559	7634	7709
6	7782	7853	7924	7993	8062	8129	8195	8261	8325	8388
7	8451	8513	8573	8633	8692	8751	8808	8865	8921	8976
8	9031	9085	9138	9191	9243	9294	9345	9395	9445	9494
9	9542	9590	9638	9685	9731	9777	9823	9868	9912	9956
10	0000	0043	0086	0128	0170	0212	0253	0294	0334	0374
11	0414	0453	0492	0531	0569	0607	0645	0682	0719	0755
12	0792	0828	0864	0899	0934	0969	1004	1038	1072	1106
13	1139	1173	1206	1239	1271	1303	1335	1367	1399	1430
14	1461	1492	1523	1553	1584	1614	1644	1673	1703	1732
15	1761	1790	1818	1847	1875	1903	1931	1959	1987	2014
16	2041	2068	2095	2122	2148	2175	2201	2227	2253	2279
17	2304	2330	2355	2380	2405	2430	2455	2480	2504	2529
18	2553	2577	2601	2625	2648	2672	2695	2718	2742	2765
19	2788	2810	2833	2856	2878	2900	2923	2945	2967	2989
20	3010	3032	3054	3075	3096	3118	3139	3160	3181	3201
21	3222	3243	3263	3284	3304	3324	3345	3365	3385	3404
22	3424	3444	3464	3483	3502	3522	3541	3560	3579	3598
23	3617	3636	3655	3674	3692	3711	3729	3747	3766	3784
24	3802	3820	3838	3856	3874	3892	3909	3927	3945	3962
25	3979	3997	4014	4031	4048	4065	4082	4099	4116	4133
26	4150	4166	4183	4200	4216	4232	4249	4265	4281	4298
27	4314	4330	4346	4362	4378	4393	4409	4425	4440	4456
28	4472	4487	4502	4518	4533	4548	4564	4579	4594	4609
29	4624	4639	4654	4669	4683	4698	4713	4728	4742	4757
30	4771	4786	4800	4814	4829	4843	4857	4871	4886	4900
31	4914	4928	4942	4955	4969	4983	4997	5011	5024	5038
32	5051	5065	5079	5092	5105	5119	5132	5145	5159	5172
33	5185	5198	5211	5224	5237	5250	5263	5276	5289	5302
34	5315	5328	5340	5353	5366	5378	5391	5403	5416	5428
35	5441	5453	5465	5478	5490	5502	5514	5527	5539	5551
36	5563	5575	5587	5599	5611	5623	5635	5647	5658	5670
37	5682	5694	5705	5717	5729	5740	5752	5763	5775	5786
38	5798	5809	5821	5832	5843	5855	5866	5877	5888	5899
39	5911	5922	5933	5944	5955	5966	5977	5988	5999	6010
40	6021	6031	6042	6053	6064	6075	6085	6096	6107	6117
41	6128	6138	6149	6160	6170	6180	6191	6201	6212	6222
42	6232	6243	6253	6263	6274	6284	6294	6304	6314	6325
43	6335	6345	6355	6365	6375	6385	6395	6405	6415	6425
44	6435	6444	6454	6464	6474	6484	6493	6503	6513	6522
45	6532	6542	6551	6561	6571	6580	6590	6599	6609	6618
46	6628	6637	6646	6656	6665	6675	6684	6693	6702	6712
47	6721	6730	6739	6749	6758	6767	6776	6785	6794	6803
48	6812	6821	6830	6839	6848	6857	6866	6875	6884	6893
49	6902	6911	6920	6928	6937	6946	6955	6964	6972	6981
50	0	1	2	3	4	5	6	7	8	9

50	0	1	2	3	4	5	6	7	8	9
50	6990	6998	7007	7016	7024	7033	7042	7050	7059	7067
51	7076	7084	7093	7101	7110	7118	7126	7135	7143	7152
52	7160	7168	7177	7185	7193	7202	7210	7218	7226	7235
53	7243	7251	7259	7267	7275	7284	7292	7300	7308	7316
54	7324	7332	7340	7348	7356	7364	7372	7380	7388	7396
55	7404	7412	7419	7427	7435	7443	7451	7459	7466	7474
56	7482	7490	7497	7505	7513	7520	7528	7536	7543	7551
57	7559	7566	7574	7582	7589	7597	7604	7612	7619	7627
58	7634	7642	7649	7657	7664	7672	7679	7686	7694	7701
59	7709	7716	7723	7731	7738	7745	7752	7760	7767	7774
60	7782	7789	7796	7803	7810	7818	7825	7832	7839	7846
61	7853	7860	7868	7875	7882	7889	7896	7903	7910	7917
62	7924	7931	7938	7945	7952	7959	7966	7973	7980	7987
63	7993	8000	8007	8014	8021	8028	8035	8041	8048	8055
64	8062	8069	8075	8082	8089	8096	8102	8109	8116	8122
65	8129	8136	8142	8149	8156	8162	8169	8176	8182	8189
66	8195	8202	8209	8215	8222	8228	8235	8241	8248	8254
67	8261	8267	8274	8280	8287	8293	8299	8306	8312	8319
68	8325	8331	8338	8344	8351	8357	8363	8370	8376	8382
69	8388	8395	8401	8407	8414	8420	8426	8432	8439	8445
70	8451	8457	8463	8470	8476	8482	8488	8494	8500	8506
71	8513	8519	8525	8531	8537	8543	8549	8555	8561	8567
72	8573	8579	8585	8591	8597	8603	8609	8615	8621	8627
73	8633	8639	8645	8651	8657	8663	8669	8675	8681	8686
74	8692	8698	8704	8710	8716	8722	8727	8733	8739	8745
75	8751	8756	8762	8768	8774	8779	8785	8791	8797	8802
76	8808	8814	8820	8825	8831	8837	8842	8848	8854	8859
77	8865	8871	8876	8882	8887	8893	8899	8904	8910	8915
78	8921	8927	8932	8938	8943	8949	8954	8960	8965	8971
79	8976	8982	8987	8993	8998	9004	9009	9015	9020	9025
80	9031	9036	9042	9047	9053	9058	9063	9069	9074	9079
81	9085	9090	9096	9101	9106	9112	9117	9122	9128	9133
82	9138	9143	9149	9154	9159	9165	9170	9175	9180	9186
83	9191	9196	9201	9206	9212	9217	9222	9227	9232	9238
84	9243	9248	9253	9258	9263	9269	9274	9279	9284	9289
85	9294	9299	9304	9309	9315	9320	9325	9330	9335	9340
86	9345	9350	9355	9360	9365	9370	9375	9380	9385	9390
87	9395	9400	9405	9410	9415	9420	9425	9430	9435	9440
88	9445	9450	9455	9460	9465	9469	9474	9479	9484	9489
89	9494	9499	9504	9509	9513	9518	9523	9528	9533	9538
90	9542	9547	9552	9557	9562	9566	9571	9576	9581	9586
91	9590	9595	9600	9605	9609	9614	9619	9624	9628	9633
92	9638	9643	9647	9652	9657	9661	9666	9671	9675	9680
93	9685	9689	9694	9699	9703	9708	9713	9717	9722	9727
94	9731	9736	9741	9745	9750	9754	9759	9763	9768	9773
95	9777	9782	9786	9791	9795	9800	9805	9809	9814	9818
96	9823	9827	9832	9836	9841	9845	9850	9854	9859	9863
97	9868	9872	9877	9881	9886	9890	9894	9899	9903	9908
98	9912	9917	9921	9926	9930	9934	9939	9943	9948	9952
99	9956	9961	9965	9969	9974	9978	9983	9987	9991	9996
100	0	1	2	3	4	5	6	7	8	9

ANGLE.	SINES.		COSINES.		TANGENTS.		COTANGENTS.		ANGLE.
	Nat.	Log.	Nat.	Log.	Nat.	Log.	Log.	Nat.	
0°00′	.0000	∞	1.0000	0.0000	.0000	∞	∞	∞	90°00′
10	.0029	7.4637	1.0000	0000	.0029	7.4637	2.5363	343.77	50
20	.0058	7648	1.0000	0000	.0058	7648	2352	171.89	40
30	.0087	9408	1.0000	0000	.0087	9409	0591	114.59	30
40	.0116	8.0658	.9999	0000	.0116	8.0658	1.9342	85.940	20
50	.0145	1627	.9999	0000	.0145	1627	8373	68.750	10
1°00′	.0175	8.2419	.9998	9.9999	.0175	8.2419	1.7581	57.290	89°00′
10	.0204	3088	.9998	9999	.0204	3089	6911	49.104	50
20	.0233	3668	.9997	9999	.0233	3669	6331	42.964	40
30	.0262	4179	.9997	9999	.0262	4181	5819	38.188	30
40	.0291	4637	.9996	9998	.0291	4638	5362	34.368	20
50	.0320	5050	.9995	9998	.0320	5053	4947	31.242	10
2°00′	.0349	8.5428	.9994	9.9997	.0349	8.5431	1.4569	28.636	88°00′
10	.0378	5776	.9993	9997	.0378	5779	4221	26.432	50
20	.0407	6097	.9992	9996	.0407	6101	3899	24.542	40
30	.0436	6397	.9990	9996	.0437	6401	3599	22.904	30
40	.0465	6677	.9989	9995	.0466	6682	3318	21.470	20
50	.0494	6940	.9988	9995	.0495	6945	3055	20.206	10
3°00′	.0523	8.7188	.9986	9.9994	.0524	8.7194	1.2806	19.081	87°00′
10	.0552	7423	.9985	9993	.0553	7429	2571	18.075	50
20	.0581	7645	.9983	9993	.0582	7652	2348	17.169	40
30	.0610	7857	.9981	9992	.0612	7865	2135	16.350	30
40	.0640	8059	.9980	9991	.0641	8067	1933	15.605	20
50	.0669	8251	.9978	9990	.0670	8261	1739	14.924	10
4°00′	.0698	8.8436	.9976	9.9989	.0699	8.8446	1.1554	14.301	86°00′
10	.0727	8613	.9974	9989	.0729	8624	1376	13.727	50
20	.0756	8783	.9971	9988	.0758	8795	1205	13.197	40
30	.0785	8946	.9969	9987	.0787	8960	1040	12.706	30
40	.0814	9104	.9967	9986	.0816	9118	0882	12.251	20
50	.0843	9256	.9964	9985	.0846	9272	0728	11.826	10
5°00′	.0872	8.9403	.9962	9.9983	.0875	8.9420	1.0580	11.430	85°00′
10	.0901	9545	.9959	9982	.0904	9563	0437	11.059	50
20	.0929	9682	.9957	9981	.0934	9701	0299	10.712	40
30	.0958	9816	.9954	9980	.0963	9836	0164	10.385	30
40	.0987	9945	.9951	9979	.0992	9966	0034	10.078	20
50	.1016	9.0070	.9948	9977	.1022	9.0093	0.9907	9.7882	10
6°00′	.1045	9.0192	.9945	9.9976	.1051	9.0216	0.9784	9.5144	84°00′
10	.1074	0311	.9942	9975	.1080	0336	9664	9.2553	50
20	.1103	0426	.9939	9973	.1110	0453	9547	9.0098	40
30	.1132	0539	.9936	9972	.1139	0567	9433	8.7769	30
40	.1161	0648	.9932	9971	.1169	0678	9322	8.5555	20
50	.1190	0755	.9929	9969	.1198	0786	9214	8.3450	10
7°00′	.1219	9.0859	.9925	9.9968	.1228	9.0891	0.9109	8.1443	83°00′
10	.1248	0961	.9922	9966	.1257	0995	9005	7.9530	50
20	.1276	1060	.9918	9964	.1287	1096	8904	7.7704	40
30	.1305	1157	.9914	9963	.1317	1194	8806	7.5958	30
40	.1334	1252	.9911	9961	.1346	1291	8709	7.4287	20
50	.1363	1345	.9907	9959	.1376	1385	8615	7.2687	10
8°00′	.1392	9.1436	.9903	9.9958	.1405	9.1478	0.8522	7.1154	82°00′
10	.1421	1525	.9899	9956	.1435	1569	8431	6.9682	50
20	.1449	1612	.9894	9954	.1465	1658	8342	6.8269	40
30	.1478	1697	.9890	9952	.1495	1745	8255	6.6912	30
40	.1507	1781	.9886	9950	.1524	1831	8169	6.5606	20
50	.1536	1863	.9881	9948	.1554	1915	8085	6.4348	10
9°00′	.1564	9.1943	.9877	9.9946	.1584	9.1997	0.8003	6.3138	81°00′
	Nat.	Log.	Nat.	Log.	Nat.	Log.	Log.	Nat.	
ANGLE.	COSINES.		SINES.		COTANGENTS.		TANGENTS.		ANGLE.

ANGLE.	SINES.		COSINES.		TANGENTS.		COTANGENTS.		ANGLE.
	Nat.	Log.	Nat.	Log.	Nat.	Log.	Log.	Nat.	
9°00′	.1564	9.1943	.9877	9.9946	.1584	9.1997	0.8003	6.3138	81°00′
10	.1593	2022	.9872	9944	.1614	2078	7922	6.1970	50
20	.1622	2100	.9868	9942	.1644	2158	7842	6.0844	40
30	.1650	2176	.9863	9940	.1673	2236	7764	5.9758	30
40	.1679	2251	.9858	9938	.1703	2313	7687	5.8708	20
50	.1708	2324	.9853	9936	.1733	2389	7611	5.7694	10
10°00′	.1736	9.2397	.9848	9.9934	.1763	9.2463	0.7537	5.6713	80°00′
10	.1765	2468	.9843	9931	.1793	2536	7464	5.5764	50
20	.1794	2538	.9838	9929	.1823	2609	7391	5.4845	40
30	.1822	2606	.9833	9927	.1853	2680	7320	5.3955	30
40	.1851	2674	.9827	9924	.1883	2750	7250	5.3093	20
50	.1880	2740	.9822	9922	.1914	2819	7181	5.2257	10
11°00′	.1908	9.2806	.9816	9.9919	.1944	9.2887	0.7113	5.1446	79°00′
10	.1937	2870	.9811	9917	.1974	2953	7047	5.0658	50
20	.1965	2934	.9805	9914	.2004	3020	6980	4.9894	40
30	.1994	2997	.9799	9912	.2035	3085	6915	4.9152	30
40	.2022	3058	.9793	9909	.2065	3149	6851	4.8430	20
50	.2051	3119	.9787	9907	.2095	3212	6788	4.7729	10
12°00′	.2079	9.3179	.9781	9.9904	.2126	9.3275	0.6725	4.7046	78°00′
10	.2108	3238	.9775	9901	.2156	3336	6664	4.6382	50
20	.2136	3296	.9769	9899	.2186	3397	6603	4.5736	40
30	.2164	3353	.9763	9896	.2217	3458	6542	4.5107	30
40	.2193	3410	.9757	9893	.2247	3517	6483	4.4494	20
50	.2221	3466	.9750	9890	.2278	3576	6424	4.3897	10
13°00′	.2250	9.3521	.9744	9.9887	.2309	9.3634	0.6366	4.3315	77°00′
10	.2278	3575	.9737	9884	.2339	3691	6309	4.2747	50
20	.2306	3629	.9730	9881	.2370	3748	6252	4.2193	40
30	.2334	3682	.9724	9878	.2401	3804	6196	4.1653	30
40	.2363	3734	.9717	9875	.2432	3859	6141	4.1126	20
50	.2391	3786	.9710	9872	.2462	3914	6086	4.0611	10
14°00′	.2419	9.3837	.9703	9.9869	.2493	9.3968	0.6032	4.0108	76°00′
10	.2447	3887	.9696	9866	.2524	4021	5979	3.9617	50
20	.2476	3937	.9689	9863	.2555	4074	5926	3.9136	40
30	.2504	3986	.9681	9859	.2586	4127	5873	3.8667	30
40	.2532	4035	.9674	9856	.2617	4178	5822	3.8208	20
50	.2560	4083	.9667	9853	.2648	4230	5770	3.7760	10
15°00′	.2588	9.4130	.9659	9.9849	.2679	9.4281	0.5719	3.7321	75°00′
10	.2616	4177	.9652	9846	.2711	4331	5669	3.6891	50
20	.2644	4223	.9644	9843	.2742	4381	5619	3.6470	40
30	.2672	4269	.9636	9839	.2773	4430	5570	3.6059	30
40	.2700	4314	.9628	9836	.2805	4479	5521	3.5656	20
50	.2728	4359	.9621	9832	.2836	4527	5473	3.5261	10
16°00′	.2756	9.4403	.9613	9.9828	.2867	9.4575	0.5425	3.4874	74°00′
10	.2784	4447	.9605	9825	.2899	4622	5378	3.4495	50
20	.2812	4491	.9596	9821	.2931	4669	5331	3.4124	40
30	.2840	4533	.9588	9817	.2962	4716	5284	3.3759	30
40	.2868	4576	.9580	9814	.2994	4762	5238	3.3402	20
50	.2896	4618	.9572	9810	.3026	4808	5192	3.3052	10
17°00′	.2924	9.4659	.9563	9.9806	.3057	9.4853	0.5147	3.2709	73°00′
10	.2952	4700	.9555	9802	.3089	4898	5102	3.2371	50
20	.2979	4741	.9546	9798	.3121	4943	5057	3.2041	40
30	.3007	4781	.9537	9794	.3153	4987	5013	3.1716	30
40	.3035	4821	.9528	9790	.3185	5031	4969	3.1397	20
50	.3062	4861	.9520	9786	.3217	5075	4925	3.1084	10
18°00′	.3090	9.4900	.9511	9.9782	.3249	9.5118	0.4882	3.0777	72°00′
	Nat.	Log.	Nat.	Log.	Nat.	Log.	Log.	Nat.	
ANGLE.	COSINES.		SINES.		COTANGENTS.		TANGENTS.		ANGLE.

ANGLE.	SINES.		COSINES.		TANGENTS.		COTANGENTS.		ANGLE.
	Nat.	Log.	Nat.	Log.	Nat.	Log.	Log.	Nat.	
18°00′	.3090	9.4900	.9511	9.9782	.3249	9.5118	0.4882	3.0777	72°00′
10	.3118	4939	.9502	9778	.3281	5161	4839	3.0475	50
20	.3145	4977	.9492	9774	.3314	5203	4797	3.0178	40
30	.3173	5015	.9483	9770	.3346	5245	4755	2.9887	30
40	.3201	5052	.9474	9765	.3378	5287	4713	2.9600	20
50	.3228	5090	.9465	9761	.3411	5329	4671	2.9319	10
19°00′	.3256	9.5126	.9455	9.9757	.3443	9.5370	0.4630	2.9042	71°00′
10	.3283	5163	.9446	9752	.3476	5411	4589	2.8770	50
20	.3311	5199	.9436	9748	.3508	5451	4549	2.8502	40
30	.3338	5235	.9426	9743	.3541	5491	4509	2.8239	30
40	.3365	5270	.9417	9739	.3574	5531	4469	2.7980	20
50	.3393	5306	.9407	9734	.3607	5571	4429	2.7725	10
20°00′	.3420	9.5341	.9397	9.9730	.3640	9.5611	0.4389	2.7475	70°00′
10	.3448	5375	.9387	9725	.3673	5650	4350	2.7228	50
20	.3475	5409	.9377	9721	.3706	5689	4311	2.6985	40
30	.3502	5443	.9367	9716	.3739	5727	4273	2.6746	30
40	.3529	5477	.9356	9711	.3772	5766	4234	2.6511	20
50	.3557	5510	.9346	9706	.3805	5804	4196	2.6279	10
21°00′	.3584	9.5543	.9336	9.9702	.3839	9.5842	0.4158	2.6051	69°00′
10	.3611	5576	.9325	9697	.3872	5879	4121	2.5826	50
20	.3638	5609	.9315	9692	.3906	5917	4083	2.5605	40
30	.3665	5641	.9304	9687	.3939	5954	4046	2.5386	30
40	.3692	5673	.9293	9682	.3973	5991	4009	2.5172	20
50	.3719	5704	.9283	9677	.4006	6028	3972	2.4960	10
22°00′	.3746	9.5736	.9272	9.9672	.4040	9.6064	0.3936	2.4751	68°00′
10	.3773	5767	.9261	9667	.4074	6100	3900	2.4545	50
20	.3800	5798	.9250	9661	.4108	6136	3864	2.4342	40
30	.3827	5828	.9239	9656	.4142	6172	3828	2.4142	30
40	.3854	5859	.9228	9651	.4176	6208	3792	2.3945	20
50	.3881	5889	.9216	9646	.4210	6243	3757	2.3750	10
23°00′	.3907	9.5919	.9205	9.9640	.4245	9.6279	0.3721	2.3559	67°00′
10	.3934	5948	.9194	9635	.4279	6314	3686	2.3369	50
20	.3961	5978	.9182	9629	.4314	6348	3652	2.3183	40
30	.3987	6007	.9171	9624	.4348	6383	3617	2.2998	30
40	.4014	6036	.9159	9618	.4383	6417	3583	2.2817	20
50	.4041	6065	.9147	9613	.4417	6452	3548	2.2637	10
24°00′	.4067	9.6093	.9135	9.9607	.4452	9.6486	0.3514	2.2460	66°00′
10	.4094	6121	.9124	9602	.4487	6520	3480	2.2286	50
20	.4120	6149	.9112	9596	.4522	6553	3447	2.2113	40
30	.4147	6177	.9100	9590	.4557	6587	3413	2.1943	30
40	.4173	6205	.9088	9584	.4592	6620	3380	2.1775	20
50	.4200	6232	.9075	9579	.4628	6654	3346	2.1609	10
25°00′	.4226	9.6259	.9063	9.9573	.4663	9.6687	0.3313	2.1445	65°00′
10	.4253	6286	.9051	9567	.4699	6720	3280	2.1283	50
20	.4279	6313	.9038	9561	.4734	6752	3248	2.1123	40
30	.4305	6340	.9026	9555	.4770	6785	3215	2.0965	30
40	.4331	6366	.9013	9549	.4806	6817	3183	2.0809	20
50	.4358	6392	.9001	9543	.4841	6850	3150	2.0655	10
26°00′	.4384	9.6418	.8988	9.9537	.4877	9.6882	0.3118	2.0503	64°00′
10	.4410	6444	.8975	9530	.4913	6914	3086	2.0353	50
20	.4436	6470	.8962	9524	.4950	6946	3054	2.0204	40
30	.4462	6495	.8949	9518	.4986	6977	3023	2.0057	30
40	.4488	6521	.8936	9512	.5022	7009	2991	1.9912	20
50	.4514	6546	.8923	9505	.5059	7040	2960	1.9768	10
27°00′	.4540	9.6570	.8910	9.9499	.5095	9.7072	0.2928	1.9626	63°00′
	Nat.	Log.	Nat.	Log.	Nat.	Log.	Log.	Nat.	
ANGLE.	COSINES.		SINES.		COTANGENTS.		TANGENTS.		ANGLE.

ANGLE.	SINES.		COSINES.		TANGENTS.		COTANGENTS.		ANGLE.
	Nat.	Log.	Nat.	Log.	Nat.	Log.	Log.	Nat.	
27°00′	.4540	9.6570	.8910	9.9499	.5095	9.7072	0.2928	1.9626	63°00′
10	.4566	6595	.8897	9492	.5132	7103	2897	1.9486	50
20	.4592	6620	.8884	9486	.5169	7134	2866	1.9347	40
30	.4617	6644	.8870	9479	.5206	7165	2835	1.9210	30
40	.4643	6668	.8857	9473	.5243	7196	2804	1.9074	20
50	.4669	6692	.8843	9466	.5280	7226	2774	1.8940	10
28°00′	.4695	9.6716	.8829	9.9459	.5317	9.7257	0.2743	1.8807	62°00′
10	.4720	6740	.8816	9453	.5354	7287	2713	1.8676	50
20	.4746	6763	.8802	9446	.5392	7317	2683	1.8546	40
30	.4772	6787	.8788	9439	.5430	7348	2652	1.8418	30
40	.4797	6810	.8774	9432	.5467	7378	2622	1.8291	20
50	.4823	6833	.8760	9425	.5505	7408	2592	1.8165	10
29°00′	.4848	9.6856	.8746	9.9418	.5543	9.7438	0.2562	1.8040	61°00′
10	.4874	6878	.8732	9411	.5581	7467	2533	1.7917	50
20	.4899	6901	.8718	9404	.5619	7497	2503	1.7796	40
30	.4924	6923	.8704	9397	.5658	7526	2474	1.7675	30
40	.4950	6946	.8689	9390	.5696	7556	2444	1.7556	20
50	.4975	6968	.8675	9383	.5735	7585	2415	1.7437	10
30°00′	.5000	9.6990	.8660	9.9375	.5774	9.7614	0.2386	1.7321	60°00′
10	.5025	7012	.8646	9368	.5812	7644	2356	1.7205	50
20	.5050	7033	.8631	9361	.5851	7673	2327	1.7090	40
30	.5075	7055	.8616	9353	.5890	7701	2299	1.6977	30
40	.5100	7076	.8601	9346	.5930	7730	2270	1.6864	20
50	.5125	7097	.8587	9338	.5969	7759	2241	1.6753	10
31°00′	.5150	9.7118	.8572	9.9331	.6009	9.7788	0.2212	1.6643	59°00′
10	.5175	7139	.8557	9323	.6048	7816	2184	1.6534	50
20	.5200	7160	.8542	9315	.6088	7845	2155	1.6426	40
30	.5225	7181	.8526	9308	.6128	7873	2127	1.6319	30
40	.5250	7201	.8511	9300	.6168	7902	2098	1.6212	20
50	.5275	7222	.8496	9292	.6208	7930	2070	1.6107	10
32°00′	.5299	9.7242	.8480	9.9284	.6249	9.7958	0.2042	1.6003	58°00′
10	.5324	7262	.8465	9276	.6289	7986	2014	1.5900	50
20	.5348	7282	.8450	9268	.6330	8014	1986	1.5798	40
30	.5373	7302	.8434	9260	.6371	8042	1958	1.5697	30
40	.5398	7322	.8418	9252	.6412	8070	1930	1.5597	20
50	.5422	7342	.8403	9244	.6453	8097	1903	1.5497	10
33°00′	.5446	9.7361	.8387	9.9236	.6494	9.8125	0.1875	1.5399	57°00′
10	.5471	7380	.8371	9228	.6536	8153	1847	1.5301	50
20	.5495	7400	.8355	9219	.6577	8180	1820	1.5204	40
30	.5519	7419	.8339	9211	.6619	8208	1792	1.5108	30
40	.5544	7438	.8323	9203	.6661	8235	1765	1.5013	20
50	.5568	7457	.8307	9194	.6703	8263	1737	1.4919	10
34°00′	.5592	9.7476	.8290	9.9186	.6745	9.8290	0.1710	1.4826	56°00′
10	.5616	7494	.8274	9177	.6787	8317	1683	1.4733	50
20	.5640	7513	.8258	9169	.6830	8344	1656	1.4641	40
30	.5664	7531	.8241	9160	.6873	8371	1629	1.4550	30
40	.5688	7550	.8225	9151	.6916	8398	1602	1.4460	20
50	.5712	7568	.8208	9142	.6959	8425	1575	1.4370	10
35°00′	.5736	9.7586	.8192	9.9134	.7002	9.8452	0.1548	1.4281	55°00′
10	.5760	7604	.8175	9125	.7046	8479	1521	1.4193	50
20	.5783	7622	.8158	9116	.7089	8506	1494	1.4106	40
30	.5807	7640	.8141	9107	.7133	8533	1467	1.4019	30
40	.5831	7657	.8124	9098	.7177	8559	1441	1.3934	20
50	.5854	7675	.8107	9089	.7221	8586	1414	1.3848	10
36°00′	.5878	9.7692	.8090	9.9080	.7265	9.8613	0.1387	1.3764	54°00′
	Nat.	Log.	Nat.	Log.	Nat.	Log.	Log.	Nat.	
ANGLE.	COSINES.		SINES.		COTANGENTS.		TANGENTS.		ANGLE.

ANGLE.	SINES.		COSINES.		TANGENTS.		COTANGENTS.		ANGLE.
	Nat.	Log.	Nat.	Log.	Nat.	Log.	Log.	Nat.	
36°00′	.5878	9.7692	.8090	9.9080	.7265	9.8613	0.1387	1.3764	54°00′
10	.5901	7710	.8073	9070	.7310	8639	1361	1.3680	50
20	.5925	7727	.8056	9061	.7355	8666	1334	1.3597	40
30	.5948	7744	.8039	9052	.7400	8692	1308	1.3514	30
40	.5972	7761	.8021	9042	.7445	8718	1282	1.3432	20
50	.5995	7778	.8004	9033	.7490	8745	1255	1.3351	10
37°00′	.6018	9.7795	.7986	9.9023	.7536	9.8771	0.1229	1.3270	53°00′
10	.6041	7811	.7969	9014	.7581	8797	1203	1.3190	50
20	.6065	7828	.7951	9004	.7627	8824	1176	1.3111	40
30	.6088	7844	.7934	8995	.7673	8850	1150	1.3032	30
40	.6111	7861	.7916	8985	.7720	8876	1124	1.2954	20
50	.6134	7877	.7898	8975	.7766	8902	1098	1.2876	10
38°00′	.6157	9.7893	.7880	9.8965	.7813	9.8928	0.1072	1.2799	52°00′
10	.6180	7910	.7862	8955	.7860	8954	1046	1.2723	50
20	.6202	7926	.7844	8945	.7907	8980	1020	1.2647	40
30	.6225	7941	.7826	8935	.7954	9006	0994	1.2572	30
40	.6248	7957	.7808	8925	.8002	9 32	0968	1.2497	20
50	.6271	7973	.7790	8915	.8050	9058	0942	1.2423	10
39°00′	.6293	9.7989	.7771	9.8905	.8098	9.9084	0.0916	1.2349	51°00′
10	.6316	8004	.7753	8895	.8146	9110	0890	1.2276	50
20	.6338	8020	.7735	8884	.8195	9135	0865	1.2203	40
30	.6361	8035	.7716	8874	.8243	9161	0839	1.2131	30
40	.6383	8050	.7698	8864	.8292	9187	0813	1.2059	20
50	.6406	8066	.7679	8853	.8342	9212	0788	1.1988	10
40°00′	.6428	9.8081	.7660	9.8843	.8391	9.9238	0.0762	1.1918	50°00′
10	.6450	8096	.7642	8832	.8441	9264	0736	1.1847	50
20	.6472	8111	.7623	8821	.8491	9289	0711	1.1778	40
30	.6494	8125	.7604	8810	.8541	9315	0685	1.1708	30
40	.6517	8140	.7585	8800	.8591	9341	0659	1.1640	20
50	.6539	8155	.7566	8789	.8642	9366	0634	1.1571	10
41°00′	.6561	9.8169	.7547	9.8778	.8693	9.9392	0.0608	1.1504	49°00′
10	.6583	8184	.7528	8767	.8744	9417	0583	1.1436	50
20	.6604	8198	.7509	8756	.8796	9443	0557	1.1369	40
30	.6626	8213	.7490	8745	.8847	9468	0532	1.1303	30
40	.6648	8227	.7470	8733	.8899	9494	0506	1.1237	20
50	.6670	8241	.7451	8722	.8952	9519	0481	1.1171	10
42°00′	.6691	9.8255	.7431	9.8711	.9004	9.9544	0.0456	1.1106	48°00′
10	.6713	8269	.7412	8699	.9057	9570	0430	1.1041	50
20	.6734	8283	.7392	8688	.9110	9595	0405	1.0977	40
30	.6756	8297	.7373	8676	.9163	9621	0379	1.0913	30
40	.6777	8311	.7353	8665	.9217	9646	0354	1.0850	20
50	.6799	8324	.7333	8653	.9271	9671	0329	1.0786	10
43°00′	.6820	9.8338	.7314	9.8641	.9325	9.9697	0.0303	1.0724	47°00′
10	.6841	8351	.7294	8699	.9380	9722	0278	1.0661	50
20	.6862	8365	.7274	8618	.9435	9747	0253	1.0599	40
30	.6884	8378	.7254	8606	.9490	9772	0228	1.0538	30
40	.6905	8391	.7234	8594	.9545	9798	0202	1.0477	20
50	.6926	8405	.7214	8582	.9601	9823	0177	1.0416	10
44°00′	.6947	9.8418	.7193	9.8569	.9657	9.9848	0.0152	1.0355	46°00′
10	.6967	8431	.7173	8557	.9713	9874	0126	1.0295	50
20	.6988	8444	.7153	8545	.9770	9899	0101	1.0235	40
30	.7009	8457	.7133	8532	.9827	9924	0076	1.0176	30
40	.7030	8469	.7112	8520	.9884	9949	0051	1.0117	20
50	.7050	8482	.7092	8507	.9942	9975	0025	1.0058	10
45°00′	.7071	9.8495	.7071	9.8495	1.0000	0.0000	0.0000	1.0000	45°00′
	Nat.	Log.	Nat.	Log.	Nat.	Log.	Log.	Nat.	
ANGLE.	COSINES.		SINES.		COTANGENTS.		TANGENTS.		ANGLE.

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